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# 9.1 Identifying Interrupts

The processor associates an identifying number with each different type of interrupt or exception.

The NMI and the exceptions recognized by the processor are assigned predetermined identifiers in the range 0 through 31. Not all of these numbers are currently used by the 80386; unassigned identifiers in this range are reserved by Intel for possible future expansion.

The identifiers of the maskable interrupts are determined by external interrupt controllers (such as Intel's 8259A Programmable Interrupt Controller) and communicated to the processor during the processor's interrupt-acknowledge sequence. The numbers assigned by an 8259A PIC can be specified by software. Any numbers in the range 32 through 255 can be used. Table 9-1 shows the assignment of interrupt and exception identifiers.

Exceptions are classified as faults, traps, or aborts depending on the way they are reported and whether restart of the instruction that caused the exception is supported.

Faults
: Faults are exceptions that are reported "before" the instruction causingthe exception. Faults are either detected before the instruction begins to execute, or during execution of the instruction. If detected during the instruction, the fault is reported with the machine restored to a state that permits the instruction to be restarted.

Traps
: A trap is an exception that is reported at the instruction boundary immediately after the instruction in which the exception was detected.

Aborts

An abort is an exception that permits neither precise location of the instruction causing the exception nor restart of the program that caused the exception. Aborts are used to report severe errors, such as hardware errors and inconsistent or illegal values in system tables.

Table 9-1. Interrupt and Exception ID Assignments

| Identifier | Description |
|---|---|
| 0 | Divide error |
| 1 | Debug exceptions |
| 2 | Nonmaskable interrupt |
| 3 | Breakpoint (one-byte INT 3 instruction) |
| 4 | Overflow (INTO instruction) |
| 5 | Bounds check (BOUND instruction) |
| 6 | Invalid opcode |
| 7 | Coprocessor not available |
| 8 | Double fault |
| 9 | (reserved) |
| 10 | Invalid TSS |
| 11 | Segment not present |
| 12 | Stack exception |
| 13 | General protection |
| 14 | Page fault |
| 15 | (reserved) |
| 16 | Coprecessor error |
| 17-31 | (reserved) |
| 32-255 | Available for external interrupts via INTR pin |

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